

FIGURE 1

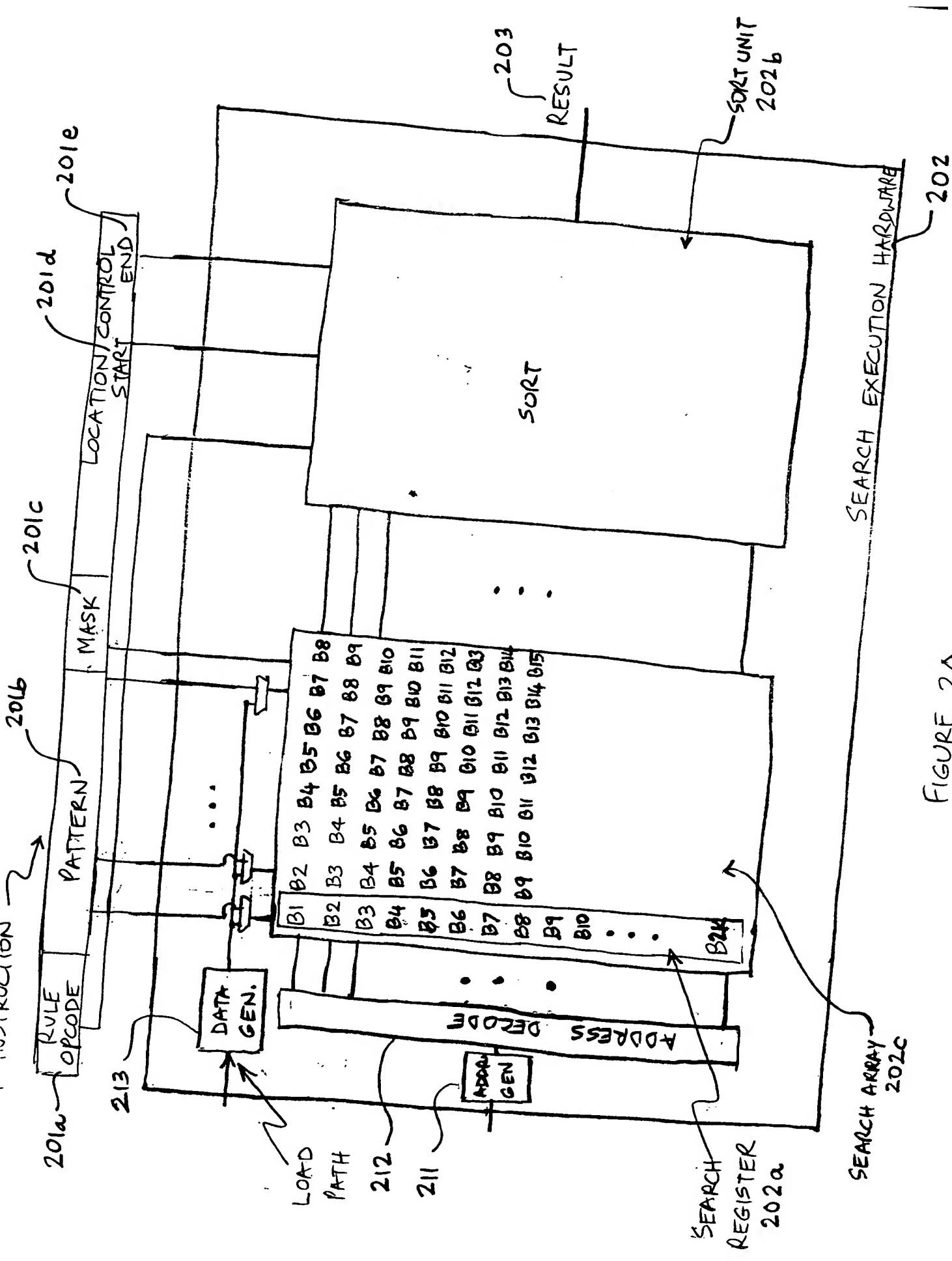


FIGURE 2A

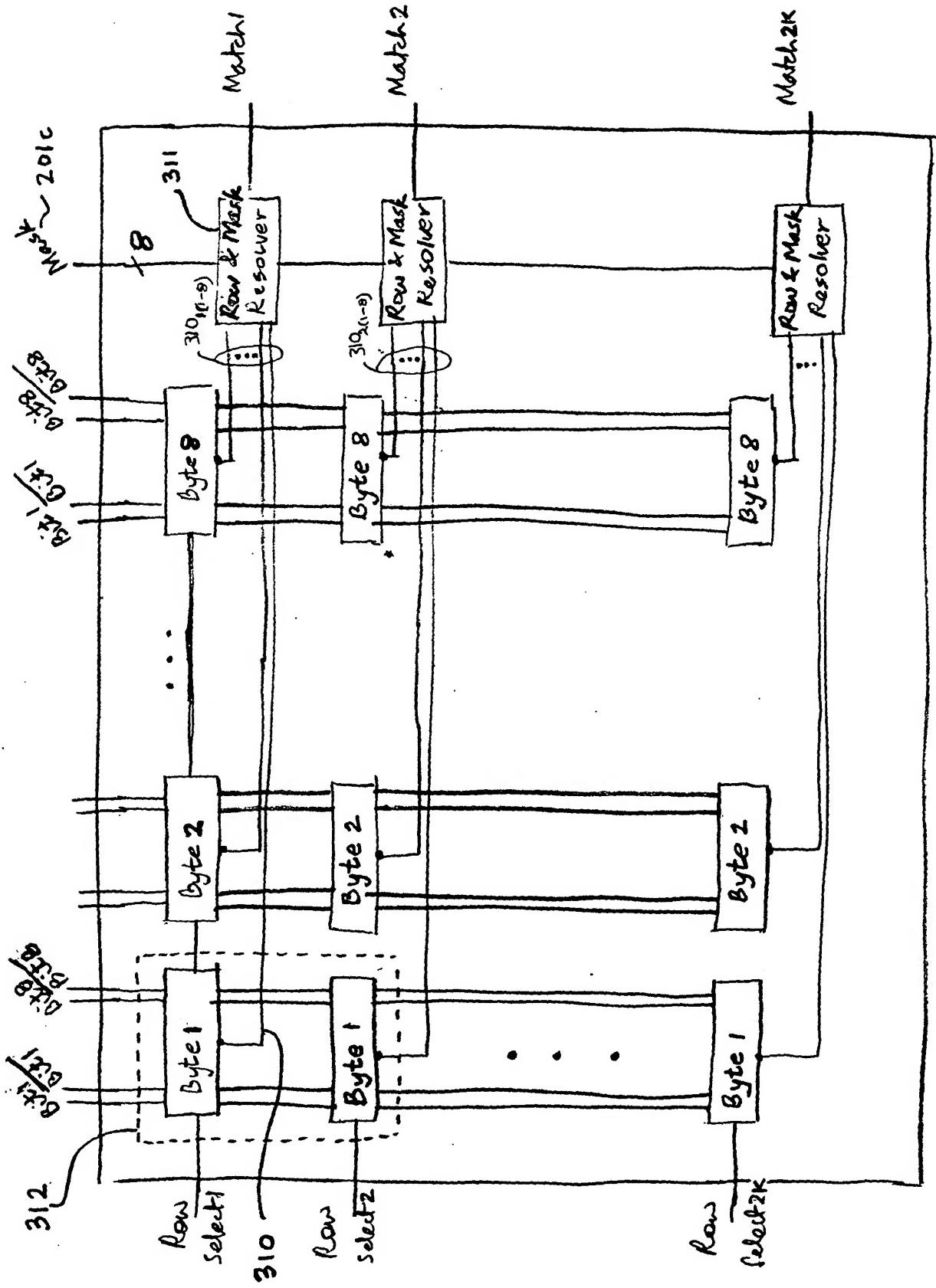
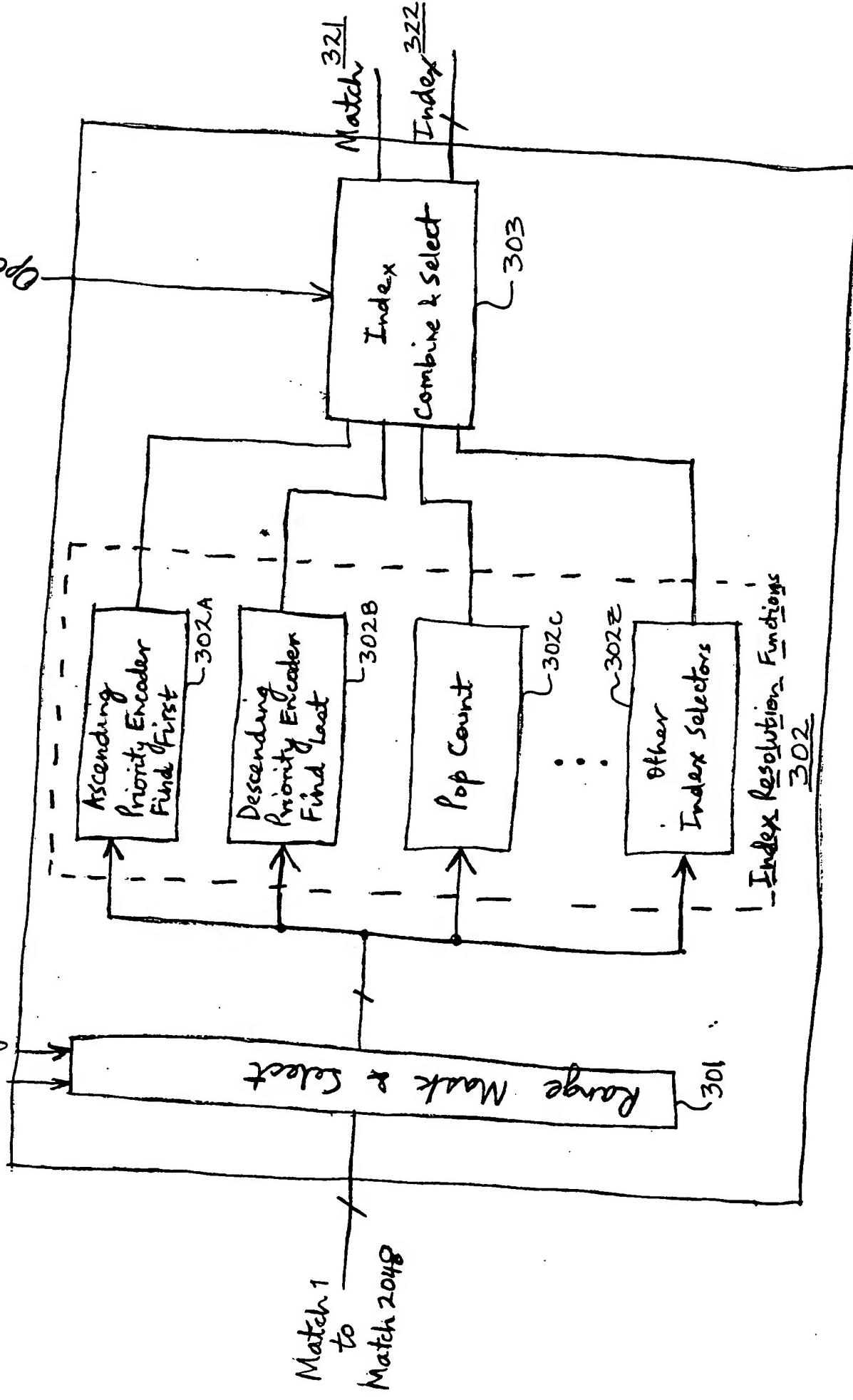


FIGURE 2B

FIGURE 3A

302₁
302₂
302₃
302₄
302₅
302₆
302₇
302₈
302₉
302₁₀

302₁₀
302₉



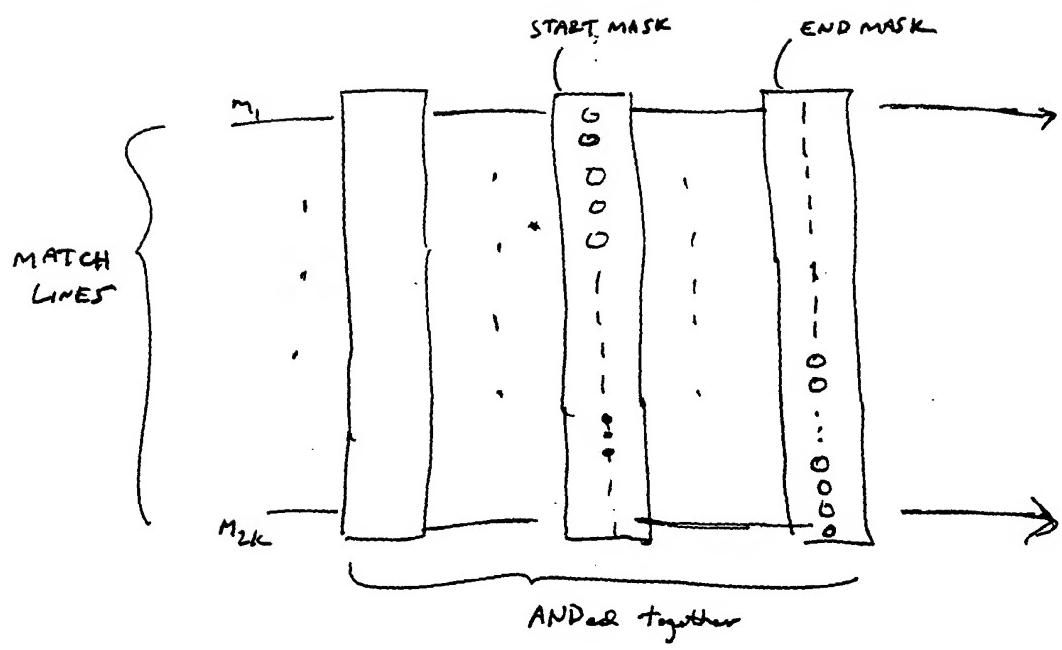
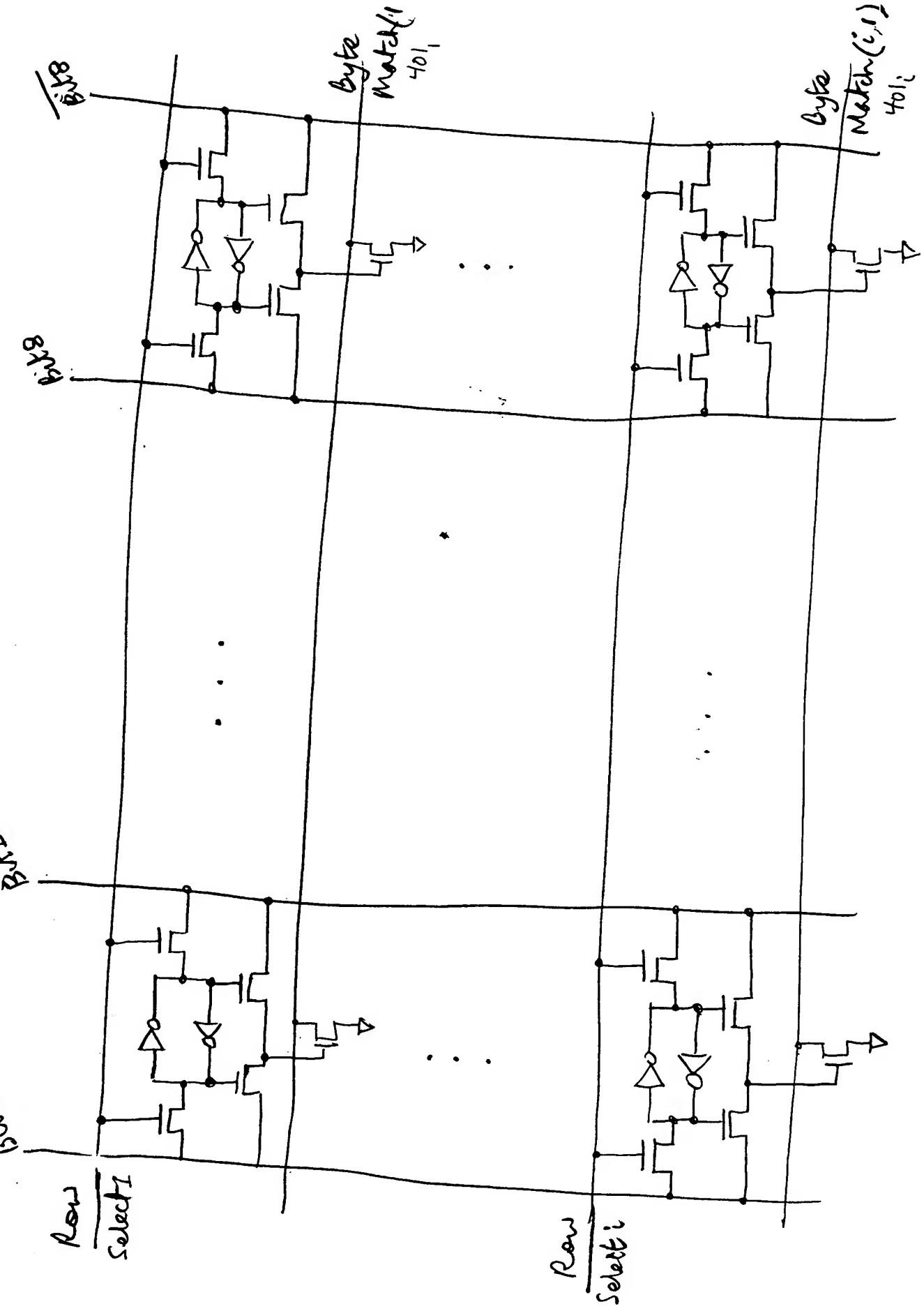


Figure 3B

FIGURE 4



Microarchitecture Diagram

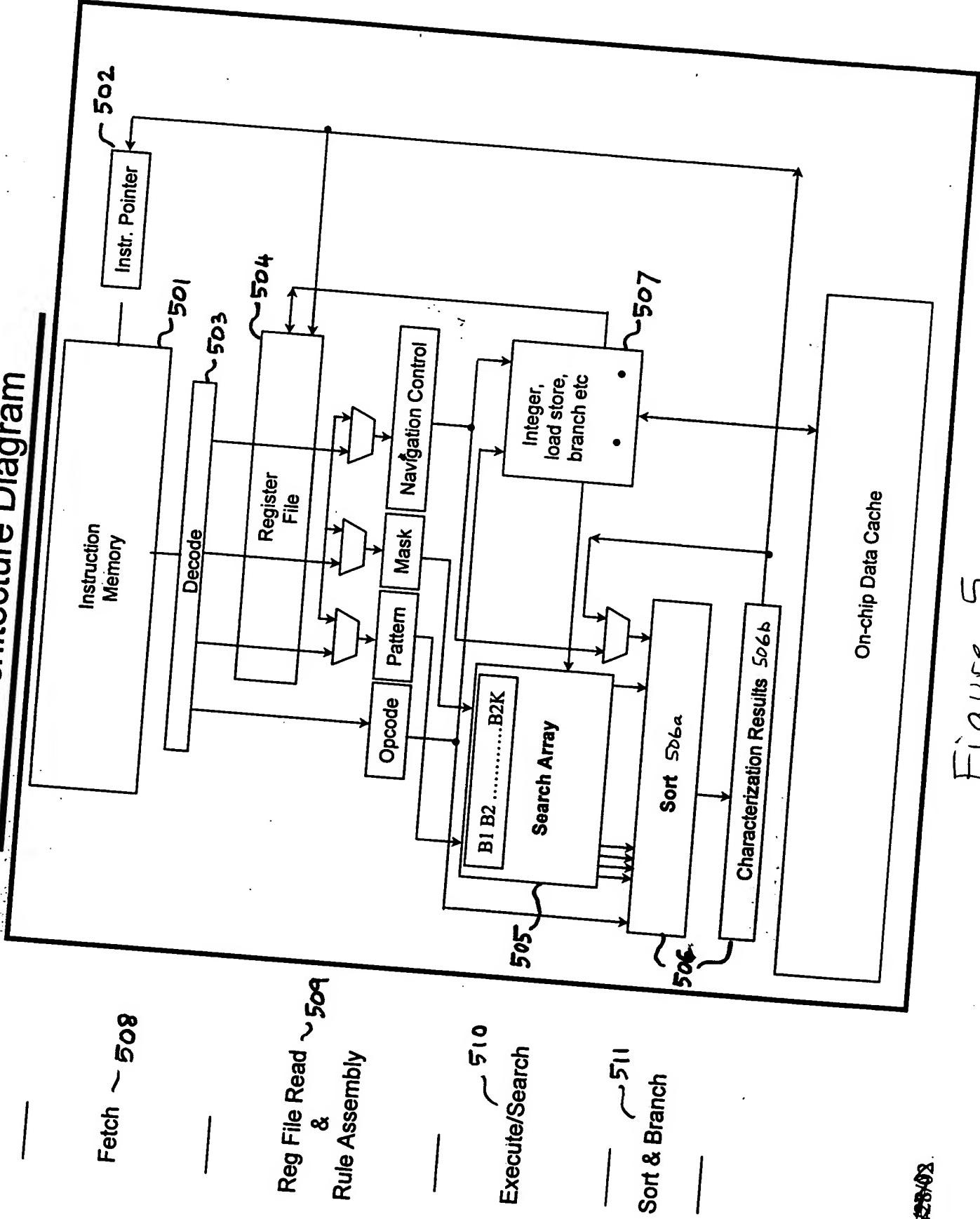


Figure 5

Example pseudo-code and Rule Engine micro-code

Pseudo-code ↗ 601

FIND ("cp /bin/sh /usr/spool/mail/root") BEFORE "chmod 4755 !\$" AND "touch" BEFORE "mail"

Micro-code for an exemplary Rule Engine

	Opcode	Pattern	Mask	Start Offset	Start Offset Indirect	End Offset	End Offset Indirect	Result Register	Branch Address
603 ↻	1 FIND_FIRST_FORWARD	"cp /bin/r"	0xFF	0x03D	0	0x800	-	0	A
604 ↻	2 FIND_FORWARD_ANCHORED	"sh /usr/r"	0xFF	<A + 8>	1	0x800	0	A	0xB
3	3 FIND_FORWARD_ANCHORED	"spool/ma"	0xFF	<A + 8>	1	0x800	0	A	0xB
4	4 FIND_FORWARD_ANCHORED	"ll/root"	0xFE	<A + 8>	1	0x800	0	A	0xB
5	5 FIND_FIRST_FORWARD	"chmod 477"	0xFF	<A + 7>	1	0x800	0	A	0xB
6	6 FIND_FORWARD_ANCHORED	"55 !\$"	0xF8	<A + 8>	1	0x800	0	A	0xB
7	7 FIND_FIRST_FORWARD	"touch"	0xF8	0x03D	0	0x800	0	B	0xB
8	8 CMP(B+5, A+5)_BRANCH(10)	-	-	-	-	-	-	-	0xA
9	9 FIND_FIRST_FORWARD	"mail"	0xF0	<A + 5>	1	0x800	0	C	0xB
10	10 FIND_FIRST_FORWARD	"mail"	0xF0	<B + 5>	1	0x800	0	C	0xB

FIGURE 6

Execution of example micro-code: pipeline diagram

	Clock 14	Clock 13	Clock 12	Clock 11	Clock 10	Clock 9	Clock 8	Clock 7	Clock 7	Clock 6	Clock 5	Clock 4	Clock 3	Clock 2	Clock 1
Fetch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Assemble	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Search/ Execute	-	-	1	2	3	4	5	6	7	8	9	10	11	12	13
Sort & Branch	-	-	-	-	1	2	3	4	5	6	7	8	9	10	11

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FIGURE 7